CLAIMS

What is claimed is:

1. A power supply controller circuit, comprising a current input circuit coupled to receive a current representative of an input voltage, the current input circuit to generate an enable/disable signal when the current crosses a threshold having a hysteresis of greater than or equal to zero, the power supply controller to activate and deactivate the power supply in response to the enable/disable signal.

2. The power supply controller circuit of claim 1 further comprising an oscillator circuit coupled to the enable/disable signal, the oscillator circuit to start and stop generating a switching waveform in response to the enable/disable signal.

3. The power supply controller circuit of claim 2 wherein the oscillator circuit is to complete an existing cycle of the switching waveform before the oscillator is to stop generating the switching waveform in response to the enable/disable signal.

4. The power supply controller circuit of claim 2 wherein the oscillator circuit is to start a new complete cycle of the switching waveform if the oscillator circuit is to start generating the switching waveform in

response to the enable/disable signal.

5. The power supply controller circuit of claim 2 further comprising a power switch coupled to a primary winding of the power supply, the power switch coupled to receive and to switch in response to the switching waveform.

6. A power supply controller circuit, comprising a current input circuit coupled to receive a current representative of an input voltage, the current input circuit to generate an enable/disable signal to activate the power supply when the current is in between a first current threshold having a first hysteresis greater than or equal to zero and second current threshold having a second hysteresis greater than or equal to zero, the second current threshold higher than the first current threshold, the current input circuit to deactivate the power supply when the current is less than the first current threshold, the current input circuit to deactivate the power supply when the current is greater than the second current threshold.

7. The power supply controller circuit of claim 6 further comprising an oscillator circuit coupled to the enable/disable signal, the oscillator circuit to start and stop generating a switching waveform in response to the enable/disable signal.

8. The power supply controller circuit of claim 7 wherein the oscillator circuit is to complete an existing cycle of the switching waveform before the oscillator is to stop generating the switching waveform in response to the enable/disable signal.

9. The power supply controller circuit of claim 7 wherein the oscillator circuit is to start a new complete cycle of the switching waveform if the oscillator circuit is to start generating the switching waveform in response to the enable/disable signal.

10. The power supply controller circuit of claim 7 further comprising a power switch coupled to a primary winding of the power supply, the power switch coupled to receive and to switch in response to the switching waveform.

11. A power supply controller circuit, comprising a current input circuit coupled to receive a current representative of an on/off control signal applied to the power supply, the current input circuit to generate an enable/disable signal to activate the power supply when the current is in between a first current threshold having a first hysteresis greater than or equal to zero and second current threshold having a hysteresis greater than or equal to zero, the second current threshold higher than the first

current threshold, the current input circuit to deactivate the power supply when the current is less than the first current threshold, the current input circuit to deactivate the power supply when the current is greater than the second current threshold.

12. A power supply controller circuit, comprising:

a current input circuit coupled to receive a current representative of an input voltage applied to a power supply, the current input circuit to generate a maximum duty cycle adjustment signal in response thereto; and

a control circuit to generate a switching waveform, the control circuit coupled to receive the maximum duty cycle adjustment signal, the control circuit to limit the duty cycle of the switching waveform to a maximum value in response to the maximum duty cycle adjustment signal, the switching waveform to regulate the power supply output.

13. The power supply controller circuit of claim 12 further comprising a power switch coupled to a primary winding of the power supply, the power switch coupled to receive and to switch in response to the switching waveform.

14. The power supply controller circuit of claim 13 wherein the maximum duty cycle adjustment signal is inversely adjusted by the current

representative of the voltage input to the power supply when the current representative of the voltage input to the power supply is greater than a first value.

15. The power supply controller circuit of claim 14 wherein the maximum duty cycle adjustment signal is independent of the current representative of the voltage input to the power supply when the current representative of the voltage input to the power supply is less than the first value.

16. The power supply controller circuit of claim 12 wherein the maximum duty cycle adjustment signal is combined with a control signal received by the control circuit.

17. The power supply controller circuit of claim 16 wherein the control circuit is a pulse width modulation circuit that includes a comparator to compare an oscillating sawtooth waveform with the combined maximum duty cycle adjustment signal and the control signal received by the pulse width modulation circuit.

18. The power supply controller circuit of claim 17 wherein the duty cycle of the switching waveform is adjusted in response to an output of the comparator.

12

19. A power supply controller circuit, comprising a current input circuit coupled to receive a current representative of an on/off control signal applied to a power supply, the current input circuit to generate enable/disable signal when the current crosses an on/off threshold having a hysteresis greater than or equal to zero, the power supply controller to activate and deactivate a power supply in response to the on/off control signal.

13 12

20. The power supply controller circuit of claim 19 further comprising an oscillator circuit coupled to the enable/disable signal, the oscillator circuit to start and stop generating a switching waveform in response to the on/off control signal.

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21. The power supply controller circuit of claim 20 wherein the oscillator circuit is to complete an existing cycle of the switching waveform before the oscillator is to stop generating the switching waveform in response to the on/off control signal.

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22. The power supply controller circuit of claim 20 wherein the oscillator circuit is to start a new complete cycle of the switching waveform if the oscillator circuit is to start generating the switching waveform in response to the on/off control signal.

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1 26. The power supply controller circuit of claim 20 further
2 comprising a power switch coupled to a primary winding of the power
3 supply, the power switch coupled to receive and to switch in response to
4 the switching waveform.

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1 24. The power supply controller circuit of claim 19 wherein the
2 on/off threshold has a hysteresis greater than or equal to zero.

18

1 25. A power supply controller circuit, comprising:
2 a current input circuit coupled to receive a current, the current input
3 circuit to generate an enable/disable signal to deactivate a power supply
4 when the magnitude of current crosses below an on/off threshold having a
5 hysteresis of greater than or equal to zero, the current input circuit to
6 activate the power supply when the current crosses above the on/off
7 threshold, the current input circuit to generate a current limit adjustment
8 signal in response to the current; and
9 a control circuit coupled to receive the current limit adjustment
10 signal, the control circuit coupled to adjust the current limit of a current
11 through a power switch in response to the current limit adjustment signal.

19 18

1 26. The power supply controller circuit of claim 25 wherein the
2 power switch is coupled to a primary winding of the power supply.

27. The power supply controller circuit of claim 26 wherein the control circuit is a pulse width modulation circuit that generates a switching waveform coupled to be received by the power switch to regulate the power supply output.

28. The power supply controller of claim 27 wherein the current is representative of a feedback signal from the power supply output, wherein the power supply voltage is regulated through current limit adjustment of the power switch in response to the feedback signal.

29. A power supply controller circuit, comprising:

a current input circuit coupled to receive a current for adjusting a current limit of a power switch, the current input circuit to generate a current limit adjustment signal in response to the current; and

a control circuit coupled to receive the current limit adjustment signal, the control circuit coupled to adjust the current limit of a current through the power switch in response to the current limit adjustment signal.

30. The power supply controller circuit of claim 29 wherein the power switch is coupled to a primary winding of the power supply.

31. The power supply controller circuit of claim 29 wherein the control circuit is a pulse width modulation circuit that generates a switching waveform coupled to be received by the power switch to regulate the power supply output.

32. The power supply controller of claim 31 wherein the current is representative of a feedback signal from the power supply output, wherein the power supply voltage is regulated through current limit adjustment of the power switch in response to the feedback signal

33. The power supply controller of claim 31 wherein the control circuit includes a first comparator coupled to compare a voltage representative of the current through the power switch with the current limit adjustment signal such that the power switch is disabled in response to an output of the first comparator when the current limit set by the current limit adjustment signal is exceeded.

34. The power supply controller of claim 33 wherein the control circuit is to generate a switching waveform controlled in response to the output of the first comparator such that the switching waveform is coupled to limit the current through the power switch.

35. The power supply controller circuit of claim 29 wherein the

current limit of the current through the power switch is adjusted by the current when the current limit of the current through the power switch is below a predetermined maximum level.

36. The power supply controller circuit of claim 35 wherein the current limit of the current through the power switch is fixed at the predetermined maximum level for magnitudes of the currents that are higher than the current value corresponding to the predetermined maximum current limit level.

37. The power supply controller of claim 29, wherein the current circuit also generates an enable/disable signal that deactivates the power supply when the magnitude of the current is below an on/off threshold, the on/off threshold having a hysteresis of zero or greater.

38. The power supply controller circuit of claim 37 further comprising an oscillator circuit coupled to an enable/disable signal, the oscillator circuit to start and stop generating a switching waveform in response to the current crossing the on/off threshold.

39. The power supply controller circuit of claim 38 wherein the oscillator circuit is to complete an existing cycle of the switching waveform before the oscillator is to stop generating the switching waveform in

response to the enable/disable signal.

40. The power supply controller circuit of claim 38 wherein the oscillator circuit is to start a new complete cycle of the switching waveform if the oscillator circuit is to start generating the switching waveform in response to the enable/disable signal.

41. The power supply controller circuit of claim 29, wherein the current is received by the current input circuit on a low impedance terminal that has a reference voltage with respect to ground.

42. The power supply controller in claim 41, wherein the current limit of the power switch is set by the value of resistance connected between the reference voltage on the low impedance terminal and ground.

43. A method for controlling a power supply, comprising:

receiving a first current representative of an input voltage to the power supply through a first terminal of a power supply controller;

activating an under-voltage signal if the first current falls below a first under-voltage threshold value;

deactivating the under-voltage signal if the first current rises above a second under-voltage threshold value;

activating the power supply in response to a deactivated under-voltage signal; and

deactivating the power supply in response to an activated under-voltage signal.

44. The method of claim 43 wherein activating the switching waveform includes starting a new complete cycle of the switching waveform.

45. The method of claim 43 wherein deactivating the switching waveform includes allowing to complete an existing cycle of the switching waveform.

46. The method of claim 43 wherein the second under-voltage threshold value is greater than the first under-voltage threshold value.

47. The method of claim 43 further comprising generating a positive current sense signal in response to the first current.

48. The method of claim 43 wherein receiving the first current representative of the input voltage to the power supply comprises coupling a resistance between the first terminal and an input of the primary winding.

49. The method of claim 43 wherein activating the power supply in response to the deactivated under-voltage signal comprises enabling a switching waveform in response to the deactivated under-voltage signal, the switching waveform to control a power switch coupled to a primary winding of the power supply.

50. The method of claim 43 wherein deactivating the power supply in response to the activated under-voltage signal comprises disabling a switching waveform in response to the activated under-voltage signal, the switching waveform to control a power switch coupled to a primary winding of the power supply.

51. A method for controlling a power supply, comprising:

receiving a first current representative of an input voltage to the power supply through a first terminal of a power supply controller;

activating an over-voltage signal if the first current rises above a first over-voltage threshold value;

deactivating the over-voltage signal if the first current falls below a second over-voltage threshold value;

activating the power supply in response to a deactivated over-voltage signal; and

deactivating the power supply in response to an activated over-

voltage signal.

52. The method of claim 51 wherein activating the switching waveform includes starting a new complete cycle of the switching waveform.

53. The method of claim 51 wherein deactivating the switching waveform includes allowing to complete an existing cycle of the switching waveform.

54. The method of claim 51 wherein the first over-voltage threshold value is greater than the second over-voltage threshold value.

55. The method of claim 51 wherein receiving the first current representative of the input voltage to the power supply comprises coupling a resistance between the first terminal and an input of the primary winding.

56. The method of claim 51 further comprising switchably coupling the first terminal to a first potential to switchably generate an over-voltage condition.

57. The method of claim 51 wherein activating the power supply in

response to the deactivated over-voltage signal comprises enabling a switching waveform in response to the deactivated over-voltage signal, the switching waveform to control a power switch coupled to a primary winding of the power supply.

58. The method of claim 51 wherein deactivating the power supply in response to the activated over-voltage signal comprises disabling a switching waveform in response to the activated over-voltage signal, the switching waveform to control a power switch coupled to a primary winding of the power supply.

59. A method for controlling a power supply, comprising:

receiving a first current representative of an input voltage to the power supply through a first terminal of a power supply controller;

switching a second current flowing through the primary winding with a switching waveform having a duty cycle;

adjusting the duty cycle of the switching waveform in response to the first current.

60. The method of claim 59 wherein the limit to the duty cycle is reduced in response to an increase in the first current if the first current is greater than a first threshold value, the first threshold having a hysteresis of greater than or equal to zero.

61. The method of claim 60 further comprising leaving unchanged the duty cycle of the switching waveform if the first current is less than or equal to the first threshold value.

62. The method of claim 59 wherein adjusting the maximum duty cycle of the switching waveform comprises:

generating a positive current sense signal in response to the first current;

generating a first voltage in response to the positive current sense signal;

comparing the first voltage with a switching sawtooth waveform; and

resetting a latch to limit the maximum duty cycle of the switching waveform in response to comparing the first voltage with the switching sawtooth waveform.

63. The method of claim 59 wherein receiving the first current representative of the input voltage to the power supply comprises coupling a resistance between the first terminal and an input of the primary winding.

64. A method for controlling a power supply, comprising:

supplying a first current from a first terminal of a power supply controller;

deactivating the power supply if the first current supplied from the first terminal falls below a first threshold value; and

activating the power supply if the first current supplied from the first terminal rises above a second threshold value.

65. The method of claim 64 wherein deactivating the power supply comprises stopping a switching waveform to control a power switch coupled to a primary winding of the power supply.

66. The method of claim 64 wherein activating the power supply comprises starting a switching waveform to control a power switch coupled to a primary winding of the power supply

67. The method of claim 64 wherein the second threshold value is greater than the first threshold value.

68. The method of claim 64 further comprising limiting the first current supplied from the first terminal to a maximum value.

69. The method of claim 65 wherein stopping the switching waveform includes allowing to complete an existing cycle of the switching

waveform.

70. The method of claim 66 wherein starting the switching waveform includes starting a new complete cycle of the switching waveform.

71. The method of claim 64 further comprising coupling a switch between the first terminal and ground.

72. The method of claim 64 further comprising coupling a variable resistance between the first terminal and ground.

73. A method for controlling a power supply, comprising:

supplying a first current from a first terminal of a power supply controller;

controlling a second current flowing through a primary winding of the power supply with a power switch coupled to the primary winding; and

adjusting a current limit of the second current in response to the first current.

74. The method of claim 73 wherein adjusting the current limit of the second current comprises increasing the current limit of the second current in response to an increase in the first current.

75. The method of claim 73 wherein adjusting the current limit of the second current comprises decreasing the current limit of the second current in response to a decrease in the first current.

76. The method of claim 73 further comprising coupling a resistance between the first terminal and ground.

77. The method of claim 73 wherein controlling a second current flowing through the primary winding comprises:

switching the power switch in response to a switching waveform; and

adjusting the switching waveform in response to the first current.

78. The method of claim 77 wherein adjusting the switching waveform comprises:

generating a first voltage in response to the first current;

generating a second voltage in response to the second current; and

adjusting the switching waveform in response to a comparison of the first voltage and the second voltage.

79. A power supply controller, comprising:

a power switch having a drain terminal, a source terminal and a gate, the drain terminal coupled to a primary winding of a power supply and the source terminal coupled to ground;

a control circuit coupled to a control terminal, the drain terminal and the gate of the power switch, the control terminal coupled to an output of the power supply, the control circuit to generate a switching waveform to control the power switch;

multi-function circuitry coupled between a multi-function terminal and the control circuit, the switching waveform generated in response to the drain terminal, the control terminal and the multi-function terminal.

80. The power supply controller of claim 79 wherein the multi-function circuitry comprises:

a negative current sensor coupled to the multi-function terminal, the negative current sensor to generate a negative current sense signal in response to the multi-function terminal if a voltage at the multi-function terminal is less than a first voltage, the negative current sensor isolated from the multi-function terminal if the voltage at the multi-function terminal is greater than the first voltage;

a positive current sensor coupled to the multi-function terminal, the positive current sensor to generate a positive current sense signal in response to the multi-function terminal if the voltage at the multi-function terminal is greater than a second voltage, the positive current sensor

isolated from the multi-function terminal if the voltage at the multi-function terminal is less than the second voltage, wherein the second voltage is greater than the first voltage, the switching waveform generated in response to the negative current sense signal and the positive current sense signal.

81. The power supply controller of claim 80 wherein the multi-function circuitry further comprises on/off circuitry coupled to receive the negative current sense signal and coupled to the control circuit, the on/off circuitry to control the control circuit to start and to stop the switching waveform in response to the multi-function terminal.

82. The power supply controller of claim 80 wherein the multi-function circuitry further comprises external current limit adjuster circuitry coupled to receive the negative current sense signal and coupled to the control circuit, the external current limit adjuster circuitry control the control circuit to adjust a current limit of the power switch in response to a current received at the multi-function terminal.

83. The power supply controller of claim 80 wherein the multi-function circuitry further comprises under-voltage comparator circuitry coupled to receive the positive current sense signal and coupled to the control circuit, the under-voltage comparator circuitry to control the control

circuit to start and to stop the switching waveform in response to a current received at the multi-function terminal.

84. The power supply controller of claim 80 wherein the multi-function circuitry further comprises over-voltage comparator circuitry coupled to receive the positive current sense signal and coupled to the control circuit, the over-voltage comparator circuitry to control the control circuit to start and to stop the switching waveform in response to a current received at the multi-function terminal.

85. The power supply controller of claim 80 wherein the multi-function circuitry further comprises maximum duty cycle adjuster circuitry coupled to receive the positive current sense signal and coupled to the control circuit, the maximum duty cycle adjuster circuitry to adjust the maximum duty cycle of the switching waveform in response to a current received at the multi-function terminal.

86. The power supply controller of claim 79 wherein a voltage at the multi-function terminal is substantially equal to a first constant voltage if there is a negative current flowing through the multi-function terminal.

87. The power supply controller of claim 79 wherein a voltage at the multi-function terminal is substantially equal to a second constant

voltage if there is a positive current flowing through the multi-function terminal.

88. A method for controlling a power supply, comprising:

generating a switching waveform to control a power switch of a power supply controller coupled to a primary winding of the power supply;

adjusting the switching waveform in response to a drain terminal of the power supply controller coupled to the primary winding, a voltage at the drain terminal indicating a current flowing through the power switch;

adjusting the switching waveform in response to a control terminal of the power supply controller coupled to an output of the power supply; and

adjusting the switching waveform in response to a current flowing through a multi-function terminal of the power supply controller.

89. The method of claim 88 wherein adjusting the switching waveform in response to the current flowing through the multi-function terminal comprises generating a negative current sense signal if the current flowing through the multi-function terminal flows out of the power supply controller from the multi-function terminal.

90. The method of claim 88 wherein adjusting the switching waveform in response to the current flowing through the multi-function

terminal comprises generating a positive current sense signal if the current flowing through the multi-function terminal flows into the power supply controller through the multi-function terminal.

91. The method of claim 89 further comprising starting and stopping the switching waveform in response to the negative current sense signal.

92. The method of claim 89 further comprising controlling the switching waveform to limit the current flowing through the power switch in response to the negative current sense signal.

93. The method of claim 90 further comprising starting and stopping the switching waveform in response to the positive current sense signal.

94. The method of claim 90 further comprising reducing a maximum duty cycle of the switching waveform in response to the positive current sense signal.

95. The method of claim 89 further comprising coupling the multi-function terminal to ground through a resistance.

96. The method of claim 89 further comprising switchably coupling the multi-function terminal to ground.

97. The method of claim 90 further comprising coupling the multi-function terminal to an input voltage of the power supply through a resistance.

98. The method of claim 90 further comprising switchably coupling the multi-function terminal to a first potential.

99. The power supply controller, comprising:

a power switch coupled between a drain terminal and a source terminal, the drain terminal to be coupled to a primary winding of a power supply;

a control circuit coupled to the power switch, the drain terminal and a control terminal, the control terminal to be coupled to an output of the power supply;

a negative current sensor coupled to a multi-function terminal;

a positive current sensor coupled to the multi-function terminal;

a on/off circuit coupled between the negative current sensor and the control circuit;

an external current limit adjuster coupled between the negative current sensor and the control circuit;

an under-voltage comparator coupled between the positive current sensor and the control circuit;

an over-voltage comparator coupled between the positive current sensor and the control circuit; and

a maximum duty cycle adjuster coupled between the positive current sensor and the control circuit.

100. The power supply controller of claim 99 further comprising enable/disable logic coupled to an output of the under-voltage comparator, to an output of the over-voltage comparator, to an output of the on/off circuit and to an input of the control circuit.

101. The power supply controller of claim 99 wherein the power switch comprises a power transistor coupled between the drain terminal and the source terminal, the power transistor having a gate coupled to the control circuit.

102. The power supply controller of claim 99 wherein the negative current sensor comprises:

a first current source coupled to the control terminal;

a first transistor having a source coupled to the first current source and a gate coupled to a drain of the first transistor;

a second transistor having a source coupled to the source of the

first transistor and a gate coupled to the gate of the first transistor;

a third transistor having a drain coupled to the drain and the gate of the first transistor and to the gate of the second transistor, the third transistor having a source coupled to the multi-function terminal and a gate coupled to a first voltage; and

a fourth transistor having a drain and gate coupled to the drain of the second transistor.

103. The power supply controller of claim 102 wherein the on/off circuit comprises:

a second current source coupled to the control terminal; and

a fifth transistor having a gate coupled to the gate and drain of the fourth transistor and a drain coupled to the second current source.

104. The power supply controller of claim 102 wherein the external current limit adjuster comprises:

a third current source coupled to the control terminal;

a fourth current source coupled to the control terminal;

a sixth transistor having a gate coupled to the gate and drain of the fourth transistor and a drain coupled to the third current source;

a seventh transistor having a gate and drain coupled to the drain of the sixth transistor;

an eighth transistor having a gate coupled to the gate and drain of

the seventh transistor, the eighth transistor having a drain coupled to the fourth current source; and

a first resistor coupled to the fourth current source and the drain of the eighth transistor.

105. The power supply controller of claim 99 wherein the positive current sensor comprises:

a ninth transistor having a source coupled to the multi-function terminal and a gate coupled to a second voltage;

a tenth transistor having a gate and drain coupled to a drain of the ninth transistor;

an eleventh transistor having a gate coupled to the gate and drain of the tenth transistor;

a twelfth transistor having a source coupled to the control terminal and a gate and drain coupled to a drain of the eleventh transistor; and

a fifth current source coupled to a source of the tenth transistor and coupled to a source of the eleventh transistor.

106. The power supply controller of claim 105 wherein the under-voltage comparator comprises:

a thirteenth transistor having a source coupled to the control terminal and having a gate coupled to the gate and drain of the twelfth transistor; and

a sixth current source coupled to a drain of the thirteenth transistor.

107. The power supply controller of claim 105 wherein the over-voltage comparator comprises:

the fourteenth transistor having a source coupled to the control terminal and having a gate coupled to the gate and drain of the twelfth transistor; and

a seventh current source coupled to a drain of the fourteenth transistor.

108. The power supply controller of claim 100 wherein the enable/disable logic comprises:

a first NOR gate having a first input coupled to the under-voltage comparator and having an inverted second input coupled to the on/off circuit; and

a second NOR gate having a first input coupled to the over-voltage comparator and having a second input coupled to an output of the first NOR gate.

109. The power supply controller of claim 105 wherein the maximum duty cycle adjuster comprises:

a fifteenth transistor having a source coupled to the control terminal and having a gate coupled to the gate and drain of the twelfth transistor;

a first diode coupled to a drain of the fifteenth transistor; and

an eighth current source coupled to the drain of the fifteenth transistor.

110. The power supply controller of claim 100 wherein the control circuit comprises:

a second resistor coupled to the control terminal;

a sixteenth transistor having a source coupled to the second resistor and a drain coupled to the maximum duty cycle adjuster;

a first comparator having a first input coupled to the source of the sixteenth transistor and the second resistor, the first comparator having a second input coupled to a third voltage;

a third resistor coupled to the drain of the sixteenth transistor;

a fourth resistor coupled to the drain of the sixteenth transistor and the third resistor;

a first capacitor coupled to the fourth resistor;

an oscillator having an enable/disable input and first, second and third switching waveform outputs, the enable/disable input of the oscillator coupled to the enable/disable logic;

a fifth resistor coupled to the drain terminal;

a sixth resistor coupled to the fifth resistor;

a second comparator having a first input coupled to the fifth and sixth resistors and a second input coupled to the external current limit

adjuster;

a third comparator having a first input coupled to the third switching waveform output and having a second input coupled to the first capacitor and the fourth resistor;

a leading edge blanking delay circuit coupled to the power switch;

a first AND gate having a first input coupled to the leading edge blanking delay circuit and having a second input coupled to an output of the second comparator;

a first OR gate having a first input coupled to an output of the first AND gate and having a second input coupled to an output of the third comparator;

a first latch having a set input coupled to the second switching waveform output and having a reset input coupled to an output of the first OR gate; and

a second AND gate having a first input coupled to the first switching waveform output and having a second input coupled to an output of the first latch, the second AND gate having an output coupled to the power switch.

111. The power supply controller of claim 110 wherein the oscillator begins generating new complete cycles of first, second and third switching waveforms at the first, second and third switching waveform outputs, respectively, in response to an enable/disable signal received at

the enable/disable input.

112. The power supply controller of claim 110 wherein the oscillator allows to complete existing cycles of first, second and third switching waveforms at the first, second and third switching waveform outputs, respectively, before stopping the first, second and third switching waveforms in response to an enable/disable signal received at the enable/disable input.